Remarks

Claims 1, 2, 4-13, 19 –23, 38, and 45-70 are in the application. Claims 1, 17, 25, 26, 27, 34, 40, 42, 45, and 56 are in independent form. Claims 61-70 are added.

Claim Rejections 35 USC § 112

Claim 2 stands rejected for indefiniteness under 35 USC § 112. Amended claim 2 deletes the phrase "at least."

Claim Rejections 35 USC § 102

Claim 19 stand rejected under 35 USC § 102 as anticipated by U.S. Pat. No. 5,031,984 to Eide et al. ("Eide"). Applicants respond as follows.

Claim 19 recites "providing a tool having a pattern to be transferred to a light –carrying waveguide" and "forming the optical waveguide aligned with the optical component by shaping a formable material using the tool." Eide does not teach a formable light-carrying waveguide. As shown in FIG. 3, Eide butts the optical fibers directly against each other, with no waveguide material between the fibers. While Figs. 7 and 8 show the fibers separated from each other, Eide states that the separation is shown for illustrative purposes only, and that the fibers should be as close together as possible. Col. 6, lines 11-14. Eide teaches that the fibers are positioned in an elastomeric mold and a UV-curable adhesive on a glass substrate is positioned over the mold. The optical fibers are aligned while monitoring the transmitted light and when the alignment is adequate, the UV adhesive is cured to hold the fibers in place. Col. 4, lines 15-33. Eide does not indicate that an adhesive is <u>between</u> the fibers or that any formable material functions as a light-

carrying waveguide. Eide does not specify any optical properties of the adhesive; its only requirement is that it is UV curable.

Claim 19 includes "applying a formable cladding material over the optical waveguide," which waveguide was formed "by shaping a formable material using the tool." Eide does not teach applying a cladding material over the optical waveguide. The Examiner cites col. 4, lines 58-60, as applying a sealing material to seal the fiber. As shown in Eide's Fig. 4, the sealing material is not applied "over the optical waveguide material." Because Eide does not teach all the elements of claim 19, applicant respectfully requests that the rejection be withdrawn.

Claims 20-23, 38, 45-50, and 56-60 stand rejected under 35 USC § 102 as anticipated by U.S. Pat. No. 4,662,962 to Malavieille ("Malavieille"). Applicants respond as follows.

Claim 20-23 recites forming a waveguide. Malavielle teaches the use an index-matching adhesive to improve "the transmission of light between the two fibers by attenuating index jumps in the separation diopters." Col. 4, lines 42-44. Malaviellie also teaches that the "prepared ends 11 and 12 of the optical fibers 1 and 1 are then inserted into the groove from its opposite ends and they are advanced until their front faces 12 and 22 come into end-to-end contact." Col. 4, lines 35-38. Thus, Malaviellie butts the ends of the fibers against each other and uses an index matching adhesive to reduce light loss at the interface by eliminating the interface. This is not a "waveguide." The Photonics Dictionary defines a waveguide as: "A system or material designed to confine and direct electromagnetic waves in a direction determined by its physical boundaries."

http://www.photonics.com/dictionary/lookup/XQ/ASP/url.lookup/entrynum.5647/letter.w/pu./Q

X/lookup.htm The adhesive does not confine and direct the light; the adhesive merely reduces the reflection at the interface.

Claim 38 recites a method of terminating an optical fiber with a connecting structure, the connecting structure including a surface oriented between 0 and 55 degrees from the optical axis of the connector. Such a connecting surface could be used, for example, for connecting to a VCSEL, an example being shown in FIG. 17 and described in paragraph [1084]. Such a method of terminating an optical fiber at a tilted surface is not described Malavielle, which describes a straight through splice of optical fibers.

Claims 45 and its dependents recite forming a waveguide, and are patentable for reasons described above with respect to claim 20. Claim 47 recites "molding a support structure onto the waveguide," the waveguide adhering to the support structure as the waveguide is removed from the precision mold (from parent claims 46). Malavieille teaches pressing a "rigid link part 8" (col. 3, lines 52-57) made of glass (col. 4, lines 58-59) or a glass link plate 208 (col. 7, lines 20) to which the fibers are glued and to which the fibers adhere upon removal from the mold. Thus, Malavielle teaches a preformed plate as a support structure and not a support structure that is molded onto the waveguide. Claim 48 further recites that the molding the support structure includes molding a cladding material. Malavieille does not teach molding a cladding material. Claims 50 also recites molding a cladding material.

Claims 56 and its dependents also recite forming a waveguide and are patenable for reasons described above with respect to claim 20. Claims 58 and 59 recite molding a support structure onto the components and the waveguide.

Claim Rejections 35 USC § 103

Claims 1, 2, and 55 stand rejected under 35 USC 103(a) for obviousness over Eide in view of Malavieille.

Claim 1 recites placing first and second components in a mold and applying a formable material into a mold to form a waveguide for carrying light between the components, with one of the first or second components including a laser or other optical component. The Examiner states that it would have been obvious to use the adhesive of Malavielle in the method of Eide to provide a method of splicing optical fibers, which is cheap and easy to use. This combination does not produce the claimed invention.

Eide places the active component in a molded housing 56 (Col. 6, line 19), not a mold, and neither reference teaches molding a waveguide to carry light to an active optical component. Eide teaches splicing optical fibers, and then routing the optical fibers to the active devices. Col. 6, lines 46-56. While a combination of Eide and Malvieille might use an adhesive to splice the optical fibers, the combination does not teach molding a waveguide to carry light to the active device. One of the problems that can be solved by the present invention is facilitating the alignment of optical devices. The prior art requires "active alignment," that is, monitoring the transmitted light as the positions of the components are adjusted, and then fixing the components at the optimum position. This process is time consuming and expensive. See Specification paragraphs [1009]-[1010] This is the process described by Eide in col. 6, line 51-56. Eide teaches that the optical devices and fibers are aligned by monitoring the transmitted light, and fixing the relative position of the active device and the optical fiber using epoxy. The invention

of claim 1 can eliminate active alignment by placing the components in a mold and molding the waveguide.

Claims 4-13 stand rejected for obviousness over Eide in view of Malavieille and further in view of US Pat. No. 4,662,962 to Daniel ("Daniel") and claims 52-54 stands rejected for obviousness over Eide in view of Malavieille and further in view of US Pat. No. 5,389,312 to Lebby et al. ("Lebby"). Applicants submit that claims 4-13 and 52-54 are patentable for the reasons described above with respect to their parent claims.

Claims 61-70 are added to more completely claim the invention.

Applicants submit that the application is allowable for reasons described above and respectfully requests reconsider and allowance.

Respectfully submitted,

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Date

By: [signature]

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